We have studied the embryos of two foam nesting frogs, *Engystomops randi* and *E. coloradorum* (Leiuperidae) from fertilization to tadpole hatching and prepared a normal table of development, which was divided into 23 stages. The foam nests, built on standing water, each contain about 200 white eggs (1.1 and 1.3 mm in diameter, respectively) that resemble *X. laevis* albino eggs and develop at almost the same rate. Embryo morphology was evaluated in whole mount preparations and vibratome sections. Somites were analyzed morphologically and by immunostaining with an anti-myosin antibody. Although both species approach the egg size and developmental rates of *X. laevis*, their development differs in significant ways, an aspect that may relate to the different breeding strategies of these frogs. The morphology of cleavage and gastrulation resembles the *X. laevis* developmental pattern. Similarly, elongation of the archenteron and notochord begins before blastopore closure. At later stages, however, embryos of *Engystomops* differ greatly from *X. laevis* not only in the general shape of the embryo at the tailbud stage, but also in the pattern of somite differentiation. The first somites were detected in the mid-neurula instead of in the late gastrula. The pattern of myotome differentiation includes the intercalation of numerous cells, similar to that which occurs in *Gastrotheca riobambae* and *Bombina variegata*. This pattern greatly differs from myotome differentiation in *X. laevis*. This is the first description of early development in frogs of the genus *Engystomops*.

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Program/Abstract # 290
Gastrulation in four species of dendrobatid frogs
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We have studied gastrulation of four closely related species of dendrobatid frogs, *Epipedobates anthonyi*, *Epipedobates tricolor*, *Epipedobates ingeri* and *Dendronbates auratus*. Developmental patterns have been compared with *Xenopus laevis* and a marsupial frog, *Gastrotheca riobambae*. Gastrulation morphology was analyzed in whole mount and in cross-sections stained for cell nuclei. We observed great variability in egg size amongst the dendrobatids (egg diameters, 1.6 to 3.5 mm). Eggs of some dendrobatids are larger than those of *G. riobambae* (3 mm in diameter). *G. riobambae* has one of the most divergent patterns of frog gastrulation, with the formation of an embryonic disk. Gastrulae of most dendrobatid frogs share with *G. riobambae* a delayed elongation of the archenteron and the formation of a large circumblastoporal collar. We therefore asked whether the formation of an embryonic disk is associated with egg size. The results show that despite the large egg size, there are similar features of gastrulation among dendrobatids, for example gastrulation time, time of archenteron expansion, thickness of the roof of both the blastocoele and archenteron and the degree of cell accumulation in the blastopore lip. Nevertheless, an embryonic disk was not formed. Egg size variation and similarity of gastrulation processes suggest that the gastrulation pattern is highly conserved among dendrobatids, and that egg size is not related to the formation of an embryonic disk. Gastrulation in dendrobatids is a useful subject for further study, as it greatly differs from *X. laevis* gastrulation.

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Program/Abstract # 291
SAGE analysis of dorsal and ventral transcriptome of *Xenopus tropicalis gastrula*
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Xenopus has been a favourable model for studying gene function during early embryonic development. Substantial progress has been made in the identification of genes and molecular mechanisms involved in dorsoventral patterning of *Xenopus* embryos. However, all these pre-genomic approaches were generally biased to the detection of a limited group of transcripts. In addition, global approaches in several species have demonstrated that transcriptomes are more complex than expected. At present, genomic approaches can be performed in *Xenopus tropicalis* because its diploid genome sequence is available. In this work, we used the global approach SAGE to identify novel genes involved in dorsoventral patterning of *Xenopus* embryos. SAGE permits a qualitative and quantitative analysis of the transcriptomes and the detection of novel transcripts. SAGE libraries were prepared from dorsal and ventral explants of *Xenopus tropicalis* gastrula and 30,000 tags/library have been obtained. Here, we present the comparative analysis of these libraries. We performed tag-mapping by using both genome sequence and known transcripts because ~35% of the experimental tags have no match in known transcripts databases. We modified a novel bioinformatics method, named *Hierarchical Gene Assignment*, for proper tag-mapping in this genome. We have begun to experimentally verify tag assignments by RT-PCR and novel transcripts identified will be used for functional studies. This is the first SAGE experiment in *Xenopus tropicalis* and we expect to find novel genes involved in dorsoventral patterning.

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Program/Abstract # 292
Syndecan-4 in non-canonical Wnt signaling and gastrulation movements in *Xenopus* embryos
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